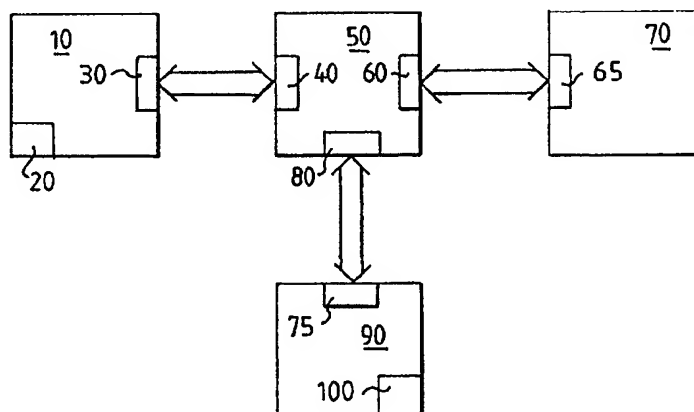




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(54) Title: METHOD FOR EXCHANGING INFORMATION BETWEEN A CASH REGISTER AND A PAYMENT-PROCESSING DEVICE

**(57) Abstract**

The invention relates to a system for the processing of means of payment and a signal-processing device comprising a first data port for communication with a cash register (10). The signal-processing device (50) also comprises a second data port for communication with a display arrangement, a third data port for communication with a payment-processing device, and a buffer unit for storage of data. The device is intended, on receiving a first data quantity at the first data port, to deliver this first data quantity to a detector means for checking a first data quantity; the detector means is arranged to convey the first data quantity onwards to the buffer unit, the buffer unit is arranged to temporarily store the received data and thereafter deliver it to the second data port, the detector unit is arranged to generate a detection signal as a function of a detected final code and to deliver this detection signal to the third data port; a calculating unit is arranged to await a payment made signal from the third data port, and the calculating unit is arranged to generate an information quantity (380) as a function of receiving the payment made signal; the signal-processing arrangement is arranged to generate a second data quantity as a function of the first data quantity and of the generated information quantity *générees* (380), and to deliver this second data quantity to the second data port.

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Method for exchanging information between a cash register and a payment-processing device.

Background to the invention

In the retail trade it is known to use a cash register for keying in the prices of the goods which a customer is purchasing and also for keying in the amount which a customer has paid. According to the prior art, a cash register
5 comprises means for calculating the total cost of the goods, also called the requested amount, and means for calculating the difference between the amount tendered and the requested amount.

According to the prior art, the cash register is coupled to a receipt printer. The cash register has a function for supplying information to the receipt
10 printer so that the latter is able to print out a receipt. It additionally has a command function which activates the receipt printer. The cash register furthermore comprises a data processing unit for calculating, for example, the difference between the amount tendered and the requested amount, this unit functioning in compliance with software specially adapted for the cash register.

15 It is also known to couple to a cash register a device for processing the means of payment, this device being of the CashGuard type (registered trademark) which is described in EP-A-0 615 643 and whose purpose is to process, i.e. receive and assess, banknotes and coins in a reliable manner. The object of this device is moreover to supply the correct amount of change and in
20 this way to eliminate or reduce the risk of financial loss and/or the possibility of taking money which is not due. However, if this device for processing payment is to be able to perform its tasks, it needs to share the information which the cash register processes. An example of information of this kind is the requested amount.

25 According to the prior art, it is necessary to adapt the abovementioned software in the cash register in order to supply the correct information to the device processing the means of payment, and in order to ensure that the correct printouts are supplied from the cash register to the receipt printer.

30 The cash register and the device for processing the payment have been coupled together by connecting the latter directly to an interface in the cash register, which interface, depending on the manufacture and design of the cash register, it has been necessary to modify in order to obtain the desired function. This has been shown to be complicated and time-consuming since it has to be
35 done for each model and manufacture of cash register which is to be used together with a payment-processing device. One is forced to make changes to the cash register's computer program, and this may require the assistance or the permission of the cash register manufacturer. In addition to this, today's cash

registers are often built into a computer network, and this may mean that it is not possible for modifications or connections to be made without the entire checkout system having to be closed down.

5 Summary

The problem to be solved by the invention compared to the nearest prior art is to enable joining up of a payment-processing device to a cash register and to a display arrangement without making it necessary to make modifications to the cash register.

10 One object of the present invention is to make available a system for the processing of means of payment including a payment-processing device which can be joined up, in an advantageously simple way, to a cash register and its receipt printer.

Another object of the present invention is to produce a payment-
15 processing device which can be joined up to different types of cash registers without it being necessary to make modifications to the cash register, either in relation to its hardware or to its software.

A further object of this invention is to produce a device which, in a simple and cost-effective way, can upgrade existing cash registers, and can also,
20 at limited expense, increase the reliability of processing of the means of payment.

These objects, and other ones which are evident from the following description, are achieved by a signal-processing device comprising a first data port for communication with a cash register, a second data port for
25 communication with a display arrangement; and a third data port for communication with a payment-processing device. The signal-processing device also comprises means for receiving a first message at the first data port, control means for generating a second message as a function of the first messages and means for transmitting the second messages in a predetermined manner to the
30 second data port as well as means for receiving a third message on the third data port, and means for generating an information quantity in response to the third message received on the third data port, the control means operating to deliver the generated information quantity to the second data port.

35 In an advantageous embodiment, the system, according to the invention, for the processing of means of payment includes a signal processing device for cooperation with a computer program product such that control of the communication between the cash register, the payment-processing device and

the display arrangement is effected. Such a computer program product comprises

- a recording medium;
 - means, recorded on the recording medium, for directing the signal-processing device to receive a first message from a cash register,
 - means, recorded on the recording medium, for directing the signal-processing device, responsive to the received first message, to generate a second message; and
 - means, recorded on the recording medium, for directing the signal-processing device to transmit the second message in a predetermined manner to a display arrangement;
 - means, recorded on the recording medium, for directing the signal-processing device to await reception of a third message from a payment-processing device;
 - means, recorded on the recording medium, for directing the signal-processing device to generate an information quantity in response to the third message;
 - means, recorded on the recording medium, for directing the signal-processing device to deliver the generated information quantity to the display arrangement.
- The claimed recording medium is illustrated in an example below by a memory element, and the claimed means, recorded on the recording medium, for directing the signal-processing device is illustrated in an example below by a program routine stored in the memory element.

Brief description of the drawings

In order to ensure that the present invention can be readily understood and implemented, it will be described by way of illustrative examples, with reference being made to the attached drawings in which:

Figure 1 shows a block diagram of a device according to the prior art;

Figure 2 shows a basic circuit diagram of an embodiment of the signal-processing device according to the present invention;

Figure 3 shows a flow chart of a first embodiment of a procedure according to the invention;

Figure 4 shows a flow chart of a second embodiment of the procedure;

Figure 5 shows a first embodiment of the system according to the present invention;

Figure 6 shows a second embodiment of the system according to the present invention;

5 Figure 7 shows a third embodiment of the system according to the present invention;

Figure 8 shows a fourth embodiment of the system according to the present invention;

10 Figure 9 shows a block diagram of a system for processing means of payment according to one embodiment;

Figure 10 shows a functional block diagram of the signal-processing unit 50.

Detailed description of the drawings

15 Figure 2 is a basic circuit diagram of an embodiment of the system.

A cash register 10 comprises members 20 for keying in data, for example price information, and a data port 30 for data communication. The cash register 10 is connected via the data port 30 to a first data port 40 of a signal-processing arrangement 50, hereinafter called the arrangement 50.

20 The arrangement 50 comprises a second data port 60 for communication with the display arrangement 70, and a third data port 80 for communication with a device 90 for processing the means of payment, hereinafter called the device 90.

25 The display arrangement 70 can consist of a printer such as a receipt printer. Alternatively, it can be a screen or a combination of printer and screen.

Figure 3 shows a flow chart of a procedure according to the invention. According to a first embodiment of the procedure, the latter comprises the stages of:

- | | | |
|----|-----|--|
| 30 | S1A | Generating a first data quantity as a function of information keyed into the cash register 10, and making available the first data quantity in coded form in accordance with a first predetermined code; |
| | S1B | Delivering the first data quantity to the data port 40 via the data port 30; |
| 35 | S1C | Receiving data from the data port 40. This data can comprise text and/or numerals, such as price information together with associated goods designation and number, for example "Toothbrush, 2', at X kronor"; |

- S2 Deciding if the received data indicates a predetermined event such as the event that all price information and all goods information have been entered. This predetermined event could be indicated by a predetermined indicator signal or by a predetermined message indicating "receipt finalized". This message, or indicator signal, is generated by a cash register 10 which is connected to the data port 40;
- 5
- S3 In the case where the received data does not correspond to the predetermined message, conveying the said data onwards to the data port 60. The data which is supplied to the data port 60 is conveyed onwards to the display arrangement 70, in order to control the function thereof. This control data can include such information as, for example, numerals and/or text which is to be printed out, configuration and set-up of the information, and information on whether the transmitted information is to be displayed. Stage S1 then follows once again.
- 10
- 15
- S4 In the case where the received data does correspond to the predetermined message, the arrangement 50 requests information concerning the actual value of the amount tendered. This value is generated by the device 90 as banknotes and/or coins are fed into the device 90. Alternatively, the actual value of the amount tendered can be generated by means of a card reader which reads an account card in a well known manner;
- 20
- S5 Receiving information on the tendered amount from the device 90 via the data port 80;
- 25
- S6 Checking the information. This check can include a calculation of whether the ratio between the amount tendered and the requested amount satisfies certain conditions;
- S7 In the case where the check conditions have not been satisfied, stage S5 must be repeated. If the check conditions are satisfied, information concerning the requested amount and information concerning the amount tendered will be supplied to the data port 60 (stage S8);
- 30
- S9 When this stage in the procedure is reached, the data which has been received from the data port 40 has been treated in accordance with the stages described above, which means that a secure payment for goods has been obtained at the device 90. The arrangement 50
- 35

controls the display arrangement 70 so that the latter displays selected information.

A second embodiment of the procedure is illustrated in Figure 4.

- 5 According to the second embodiment, the first stages correspond to the above-described stages S1A, S1B, S1C, S2 and S3.

The predetermined message which is checked in stage S2 is the message indicating receipt finalized, i.e. a confirmation from the cash register that the price information for all the goods a customer wishes to purchase has
10 been keyed in. When, in stage S2, the predetermined message has been received and has been found to be correct, the stages carried out according to the second embodiment are:

- S4B Sending a message to the device 90 for processing the means of
15 payment, with an instruction to request that the operator feed in the means of payment.

Stages S5B and S6B are then carried out.

- In stage S5B the device 90 generates a request signal to an operator
20 to the effect that means of payment need to be fed in. This signal can be displayed via a display member 100 arranged on the device 90. According to one variant of the invention, the request signal is delivered to the display arrangement 70 in order thereby to draw the operator's attention to the fact that means of payment need to be fed in.

- 25 According to the second embodiment, the stage S6B comprises calculating a difference D between the amount tendered B_i and the requested amount B_a .

$$D = B_i - B_a.$$

- According to the second embodiment of the procedure, the
30 difference D is compared with a preset value K. The value K determines what difference D can be accepted between the amounts B_i and B_a .

According to one variant of the invention, the variable K has the value zero, and the criterion for the check stage S7b is that D be greater than or equal to K.

- 35 If the variable K has the preset value zero, this check stage means that the amount tendered must be greater than or equal to the requested amount if the device 90 is to be able to dispense any money. This provides the advantageous effect of limiting the amount of money dispensed by to a value

lower than or equal to the amount received. Thereby financial losses, due to the wrong amount of change being handed out, are eliminated

The stage S8B is performed if the above-described checking criteria have been satisfied. In stage S8B, information, such as amount tendered B_i , requested amount B_a and the difference D , is delivered to the display arrangement 70 via the data port 60.

After stage S8B, the above-described stage S9 is carried out.

10 S10 After stage S9, the arrangement 50 generates a proceed signal which is delivered to the device 90.

On receiving the proceed signal, the device 90 carries out the measures which are needed for dispensing money amounting to a sum corresponding to the difference D . In addition, a counter mechanism which is internal to the payment-processing device 90, and which counts the tendered amounts relating to the current transaction, can be reset so that a new function cycle can be begun.

According to a first embodiment of the invention, which is shown in Figure 5, the signal-processing unit 50 constitutes an individual unit which is physically separate from a cash register 10, a display arrangement 70 and a device 90 for processing payment means.

The second, third and fourth embodiments, which are shown in Figures 6, 7 and 8, respectively, show how the signal-processing unit 50 is an integrated part of, respectively, the cash register 10, the display arrangement 70 and the payment-processing device 90.

According to one version of the invention, which is useful at least in the embodiments shown in Figures 5, 7 and 8, the signal-processing device 50 emulates the communications interface of a display arrangement, such as a receipt printer. Hence, the communication between the device 50 and the device 10 is performed such that messages or signals may be transmitted in both directions.

Figure 9 shows a block diagram of a system for processing payment means according to one embodiment. The system comprises a data input unit 20 which is integrated in the cash register 10. The data input unit 20 is intended for keying in a first data quantity, from which data quantity the first numerical value B_a can be calculated.

The data input unit 20 is arranged to provide the first data quantity in coded form, according to a first predetermined code, to the data bus 30 of the cash register. The term "first predetermined code" includes the manner and the order of delivery of the price information, the goods designation and the number
5 of items of the goods. One type of input unit 20 may present the information in accordance to one specific code, while another type of cash register provides the same information in accordance to another specific code.

The first predetermined code may also be defined as the manner of transmission of the information which is supplied to the data port 40. Moreover
10 the predetermined message indicating receipt finalized from the cash register 10 may differ from one type of cash register to another.

The system moreover comprises a storage member 200 which is integrated in the device 90 for processing payment means and which is used for storing the payment means, such as banknotes and coins. These payment means
15 are arranged in the storage member 200 in a theft-proof manner and can be removed from the storage member only by means of a dispensing member 220 in compliance with a dispense signal.

The device 90 comprises at least one input unit 210 for feeding payment means into the storage member 200.

20 The input unit for payment means comprises a detector means 230 for generating a second numerical value B_i as a function of the payment means which are fed in. The second numerical value B_i corresponds to the amount of money tendered by a customer at the checkout point to which the device 90 is coupled.

25 The system moreover comprises a signal-processing arrangement 50 comprising a control means which is arranged to generate the dispense signal as a function of the first numerical value, i.e. the requested amount B_a , and the second numerical value, i.e. the amount tendered B_i . The control means comprises a first memory element 240 in which at least one selectable program
30 routine is stored in a memory segment 250.

A second selectable program routine is stored in a second memory segment 260. A computer unit 270 is arranged to operate in accordance with the selected program routine. The memory element 240 can comprise a plurality of program routines, with each of the program routines being adapted so as to
35 cause the computer unit to interpret the first data quantity in accordance with their respective specific codes. To set up the device 50 for communication with a specific type of cash register, a program routine is chosen which is adapted for this purpose. Thereby the signal-processing device 50 can be joined up to

different types of cash registers and to different types of display arrangements in an advantageously simple way.

The program routine can be selected by using a selector member 280 which can communicate with the computer unit 270. The selector member can
5 comprise an array of hardware switches which can be set to the desired position by an operator. Alternatively, the selection can be made automatically on joining up the arrangement 50 to a cash register 10 or to a display member 70.

The arrangement 50 also comprises a memory element 290 for temporary storage of a predetermined number of messages constituting a part of
10 the first data quantity. The signal-processing device 50 cooperates with the memory element 290, in accordance with instructions recorded in the memory 290, to control the communication between the cash register 10, the payment-processing device 90 and the display arrangement 70. The computer unit 270 is arranged to operate in accordance with the selected program routine such that
15 the computer unit 270 in cooperation with the memory element 290 and the data ports 40, 60 and 80 at least temporarily stores a received message until the next consecutive message is received on data port 40. The resulting function of the signal-processing device 50 is described in connection with Figure 10 below.

Figure 10 shows a functional block diagram of the signal-processing
20 device 50. A first data quantity which is received from the port 40 passes through a detector means 300 which has the task of reading off data and detecting the data message 310 for receipt finalized.

The first data quantity comprises one or more messages or data sets. Each data set can comprise a character combination and one or more digits. The
25 character combination can be, for example, a goods description, and the digits can represent quantity information and/or price information.

As long as the message indicating receipt finalized 310 does not appear, all data are conveyed onwards via a data buffer 320 to the data port 60. The data buffer 320 may, in physical embodiment, comprise a micro processor
30 cooperating with a memory element 290 as described in connection with Figure 9 above.

A receipt printer 70 can be coupled to the data port 60. The receipt printer 70 provides printouts of the data coming from the data port 60.

The data buffer 320 stores an arbitrary quantity of the data received
35 from the port 40 in accordance with the "first in, first out" principle, and then delivers the information to the data port 60. Data destined for the receipt printer 70 is thereby initially delayed, but for such a short time that this does not affect the processing or the function of the cash register 10, and for a time which is

sufficiently long for the signal-processing unit 50 to have the opportunity to process the data located in the buffer 320. A second data quantity is generated during this processing, and the final printout is thus manipulated.

When the detector means 300 detects the data code for receipt
5 finalized 310, the receipt printer 70 is stopped instantaneously, after which a detection signal 330 is generated by the detector 300 and is delivered to a transmitter unit 340 which, via a data bus 350, delivers a request signal which requests the payment-processing device 90 to deliver information concerning the amount tendered Bi.

10 On receiving this request signal, the device 90 delivers information concerning the tendered amount Bi via the data bus 350 to a receiving unit 360. The receiving unit 360 and the transmitter unit 340 are included in the data port 80.

A calculating unit 370 calculates the difference D between the
15 amount Bi from the device 90 processing the payment means, and the requested amount Ba delivered from the cash register 10. The requested amount Ba is located in the data buffer. The requested amount Ba is located in the first data quantity among the data which arrived at the buffer 320 before the data code for receipt finalized 310. This data set comprises a reference which is usually
20 "subtotal" or "total", and a figure corresponding to the requested amount Ba.

If the amount Bi which is paid into the payment-processing device 90 is greater than or equal to the requested amount Ba from the cash register 10, the receipt will be finalized by supplying an information quantity 380 into the data buffer 320. The information quantity 380 is supplied ahead of the data code
25 for receipt finalized 310. This information quantity 380 is preferably data sets comprising texts and sums of the requested amount Ba, the amount tendered Bi and any change to be returned D. This information quantity 380 and the data code for receipt finalized 310 constitute the concluding part of the second data quantity. When the whole of the second data quantity has been delivered to the
30 data port 60, the receipt printer 70 is instructed to execute the final printout and finalize the receipt.

The calculating unit 370 generates a signal 390 as a function of the finalizing of the receipt, which signal 390 is delivered via the transmitting unit 340 to the payment-processing device 90 which is requested to pay out any
35 difference D as change if the difference D is greater than zero. A counter mechanism which is internal to the payment-processing device 90 and is used for payments relating to the current transaction can then be reset so that a new function cycle can be begun.

If the response Bi from the payment-processing device 90 does not come to the requested amount, the transmitting unit 340 of the arrangement 50 delivers, according to one embodiment, a request signal to the payment-processing device 90. As a function thereof, the payment-processing device 90
5 communicates the message that further payment is required.

The receipt printer 70 will finalize the receipt only when it receives the code for receipt finalized 310. This does not occur until the payment comes to at least the amount requested by the cash register 10. The cash register 10 can also receive a wait signal 400 from the receipt printer 70 via a bus 410.
10 Alternatively, the wait signal can be generated by the calculating unit 370 and is delivered to the cash register. The wait signal indicates that the printout is not yet ready, which can prevent the cash register 10 from beginning to register new entries in a new transaction corresponding to a new receipt.

Patent Claims

1. System for the processing of means of payment, which system comprises:
 - 5 a data input unit (10, 20) for inputting of a first data quantity, from which data quantity a first numerical value (Ba) can be calculated, the data input unit (10, 20) being arranged to provide the first data quantity in coded form according to a first predetermined code;
 - a storage member (90, 200) which is functionally connected to the
 - 10 data input unit (10, 20) and which is used for storing means of payment, which storage member (90) comprises:
 - at least one input unit (210) for feeding means of payment into the storage member (200), the input unit comprising a detector means for generating a second numerical value (Bi) as a function of the payment
 - 15 means which are fed in; and
 - at least one dispensing unit (220) for dispensing means of payment from the storage member (200);
 - a control means which is arranged to generate a dispense signal as a function of the first numerical value and the second numerical value; the
 - 20 dispensing unit (220) being arranged to dispense means of payment from the storage member (200) as a function of the dispense signal;
 - the control means comprising:
 - a first memory element (240) in which at least one selectable program routine is stored; and
 - 25 a computer unit which is arranged to operate in accordance with the selectable program routine, the selected program routine being adapted so as to cause the computer unit to interpret the first data quantity in accordance with the first code.
- 30 2. System according to Claim 1, which system comprises a display arrangement (70) which is functionally connected to the control means and is used for displaying a second data quantity.
3. System according to Claim 2, in which the computer unit is arranged
- 35 to generate the second data quantity as a function of the first data quantity.
4. System according to Claim 2, in which the storage member comprises a data processing unit which comprises a status-monitoring unit for

generating a status signal indicating the status of the storage member; and the data processing unit is arranged to generate the second data quantity as a function of the status signal.

- 5 5. System according to any of Claims 2, 3 and 4, in which the display member is arranged to receive display information coded according to a second predetermined code, which second code can be differentiated from the first code.
- 10 6. Signal-processing arrangement comprising:
a first data port for communication with a cash register;
a second data port for communication with a display arrangement;
a third data port for communication with a payment-processing device;
15 a buffer unit (320; 290) for storage of data,
in which the arrangement is intended, on receiving a first data quantity at the first data port, to deliver this first data quantity to a detector unit for checking a first data quantity;
the detector unit (300) is arranged to convey the first data quantity
20 onwards to the buffer unit,
the buffer unit (320; 290) is arranged to temporarily store the received data and thereafter to deliver it to the second data port (60),
the detector unit is arranged to generate a detection signal as a function of a detected final code and to deliver this detection signal to the third
25 data port;
a calculating unit is arranged to await a payment made signal from the third data port, and the calculating unit is arranged to generate an information quantity (380) as a function of receiving the payment made signal;
the signal-processing arrangement is arranged to generate a second
30 data quantity as a function of the first data quantity and of the generated information quantity (380), and to deliver this second data quantity to the second data port.
7. System for the processing of means of payment, which system
35 comprises:
a data input unit (10, 20) for inputting of a first data quantity, from which data quantity a first numerical value (Ba) can be calculated, the data input

unit (10, 20) being arranged to provide the first data quantity in coded form according to a first predetermined code;

a storage member (90, 200) which is functionally connected to the data input unit (10, 20) and which is used for storing means of payment, which

5 storage member (90) comprises:

at least one input unit (210) for feeding means of payment into the storage member (200), the input unit comprising a detector means for generating a second numerical value (Bi) as a function of the payment means which are fed in; and

10 at least one dispensing unit (220) for dispensing means of payment from the storage member (200);

a control means which is arranged to generate a dispense signal as a function of the first numerical value and the second numerical value; and the dispensing unit (220) is arranged to dispense means of payment from the storage

15 member (200) as a function of the dispense signal;

and the control means is arranged to interpret the first data quantity in accordance with the first code.

8. System for the processing of means of payment, which system comprises:

20 a data input unit (10, 20) for inputting of a first data quantity, from which data quantity a first numerical value (Ba) can be calculated, the data input unit (10, 20) being arranged to provide the first data quantity in coded form according to a first predetermined code;

25 a control means which is arranged to generate a second data quantity as a function of the first data quantity, the second data quantity being coded according to a second code;

a display arrangement (70) which is connected to the control means and is used for receiving information coded according to the second code and for display thereof.

30

9. Signal-processing device (50) comprising:

a first data port (40) for communication with a cash register;

a second data port (60) for communication with a display arrangement;

35 a third data port (80) for communication with a payment-processing device;

means (270; 300) for receiving a first message at the first data port;

control means (270; 370) for generating a second message as a function of the first message;

means (270; 320) for transmitting the second message in a predetermined manner to the second data port; and

5 means (270, 290; 360) for receiving a third message on the third data port (80);

means (270; 290; 370) for generating an information quantity (280) in response to the third message received on the third data port(80);

10 the control means operating to deliver the generated information quantity to the second data port (60).

10. Signal-processing device (50) according to claim 9 wherein :

the control means operates to interpret the first messages according to a first predetermined code; and wherein

15 the control means operates to deliver the second messages to the third data port (60) coded according to a second code.

11. Signal-processing device (50) according to claim 9 or 10, wherein

20 the control means operates to calculate a first numerical value (Ba) in response to the first messages or wherein one of the first messages is a first numerical value (Ba) which is the result of a calculation in response to the preceeding first messages;

25 the control means operates to deliver a request signal on the third data port (80) in response to detection of a first message (310) indicating the end of a stream of first messages; and wherein

the control means operates to await said third message after having delivered the request signal.

12. Signal-processing device according to claim 11, wherein

30 the control means, when receiving the third message including a second numerical value (Bi), operates to calculate a difference (D) between the second numerical value (Bi) and the first numerical value (Ba).

13. Signal-processing device (50) according to claim 12, wherein :

35 the control means operates to perform a check stage including a comparison of the the difference (D) with a predetermined value (K) such that if the checking criteria have been satisfied the control means delivers a proceed signal to the third data port (80).

14. Signal-processing device (50) according to claim 12 or 13, wherein :

the control means operates to include the first numerical value (Ba) and the second numerical value (Bi) in the generated information quantity (380); and

5 wherein the control means operates to deliver the generated information quantity (380) to the second data port prior to delivering a second message indicating the end of a stream of second messages.

15. Signal-processing device (50) according to claim 11, wherein :

10 the control means operates to generate a second message indicating the end of a stream of second messages in response to the first message indicating the end of a stream of first messages.

16. Signal-processing device (50) according to any of claims 9 to 15,

15 comprising:

a first memory means for storing a computer program routine; and
wherein

the control means includes a processor unit (270) set up to operate according to the computer program routine.

20

17. Signal-processing device (50) according to claim 16, wherein:

the first memory means comprises a plurality of individually selectable computer program routines, each of the program routines being adapted such that in operation the selected routine causes the computer unit to interpret the
25 first messages in accordance with a specific code.

18. A system for the processing of means of payment, the system comprising:

a signal-processing device (50) according to any of claims 9 to 17;

a cash register (10) for inputting of information, the cash register
30 including means for communicating with the first data port; and

a display arrangement for for displaying information and/or for printing information, the display arrangement including means for communicating with the second data port; and

a payment-processing device (90), the payment-processing device including
35 means for communicating with the third data port.

19. Process for controlling the communication between a data input unit (20, 10), a payment-processing device (90) and a display arrangement (70) via a

- signal-processing device (50), the signal-processing device (50) including
a first means (40) for communication with the data input unit (20, 10);
a second means (60) for communication with the display arrangement;
a third means (90) for communication with the payment-processing
5 device;
the process comprising the steps of :
receiving a first message from the data input unit (10, 20),
generating a second message in response to the received first message;
transmitting the second message in a predetermined manner to the
10 display arrangement (70);
awaiting reception of a third message from a payment-processing device
(90);
generating an information quantity (280) in response to the third
message;
15 delivering the generated information quantity to the display arrangement.
20. System for the processing of means of payment, which system comprises:
a data input unit (20, 10),
a payment-processing device (90),
20 a display arrangement for displaying information and/or for printing
information, and
a signal-processing device (50) for cooperation with a computer program
product (240, 250, 260) for controlling the communication between the data
input unit (20, 10), the payment-processing device (90) and the display
25 arrangement;
the signal-processing device (50) including
a first means (40) for communication with the data input unit (20, 10);
a second means (60) for communication with the display arrangement;
a third means (90) for communication with the payment-processing
30 device;
a memory means (290) ; and
a processor unit (270);
the processor unit (270) being coupled to the communications means (40,
60, 90) and to the memory means (290) such that during cooperation with the
35 computer program product (240, 250, 260) the process according to claim 19 is
performed.

21. A computer program product for cooperation with a signal-processing device (50) for controlling the communication between a data input unit (20, 10), a payment-processing device (90) and a display arrangement; the signal-processing device (50) including a first means (40) for communication
5 with the data input unit (20, 10); a second means (60) for communication with the display arrangement; a third means (90) for communication with the payment-processing device; a memory means (290) ; and a processor unit (270); the processor unit (270) being coupled to the communications means (40, 60, 90) and to the memory means (290);
10 the computer program product comprising:
 a recording medium;
 means, recorded on the recording medium, for directing the signal-processing device (50) to receive a first message from the data input unit (20, 10),
15 means, recorded on the recording medium, for directing the signal-processing device (50), responsive to the received first message, to generate a second message; and
 means, recorded on the recording medium, for directing the signal-processing device (50) to transmit the second message in a predetermined
20 manner to the display arrangement (70);
 means, recorded on the recording medium, for directing the signal-processing device (50) to await reception of a third message from the payment-processing device (90);
 means, recorded on the recording medium, for directing the signal-
25 processing device (50) to generate an information quantity (280) in response to the third message;
 means, recorded on the recording medium, for directing the signal-processing device (50) to deliver the generated information quantity to the display arrangement.
30

22. A computer program product for use with a signal-processing device (50) in a system for the processing of means of payment, for controlling the communication between a cash register (10), a payment-processing device (90)
35 and a display arrangement for displaying information and/or for printing information;
the computer program product comprising:
 a recording medium;

means, recorded on the recording medium, for directing the signal-processing device (50) to receive a first message from a cash register (10),

means, recorded on the recording medium, for directing the signal-processing device (50), responsive to the received first message, to generate a
5 second message; and

means, recorded on the recording medium, for directing the signal-processing device (50) to transmit the second message in a predetermined manner to a display arrangement (70);

means, recorded on the recording medium, for directing the signal-
10 processing device (50) to await reception of a third message from a payment-processing device (90);

means, recorded on the recording medium, for directing the signal-processing device (50) to generate an information quantity (280) in response to the third message;

15 means, recorded on the recording medium, for directing the signal-processing device (50) to deliver the generated information quantity to the display arrangement.

23. A computer program product according to claim 22, further comprising:

20 means, recorded on the recording medium, for directing the signal-processing device (50) to interpret the first messages according to a first predetermined code algorithm;

means, recorded on the recording medium, for directing the signal-processing device (50) to deliver the second messages to the display
25 arrangement coded according to a second code.

24. A computer program product according to claim 22 or 23, further comprising:

30 means, recorded on the recording medium, for directing the signal-processing device (50) to calculate a first numerical value (Ba) in response to the first messages;

means, recorded on the recording medium, for directing the signal-processing device (50) to deliver a request signal to the payment-processing device (90) in response to detection of a first message (310) indicating the end
35 of a stream of first messages;

means, recorded on the recording medium, for directing the signal-processing device (50) to await said third message after having delivered the request signal.

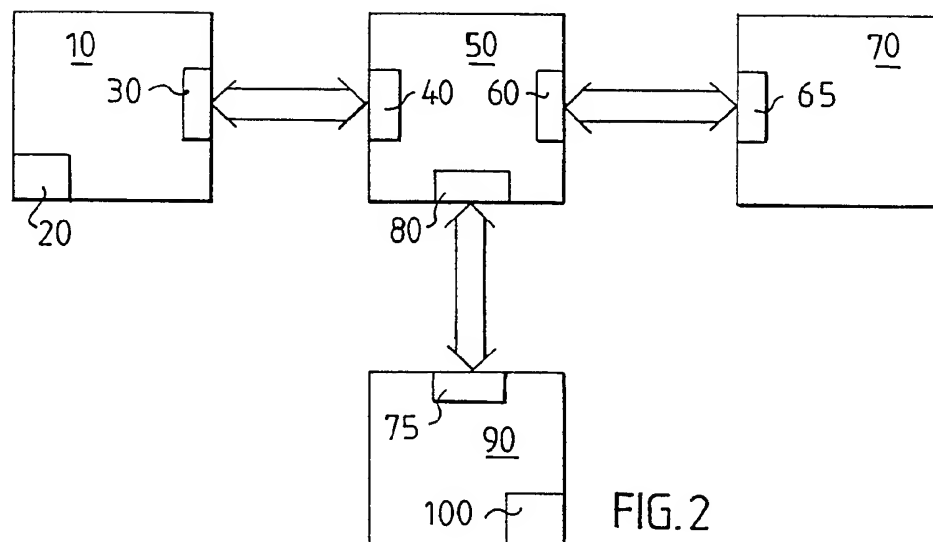
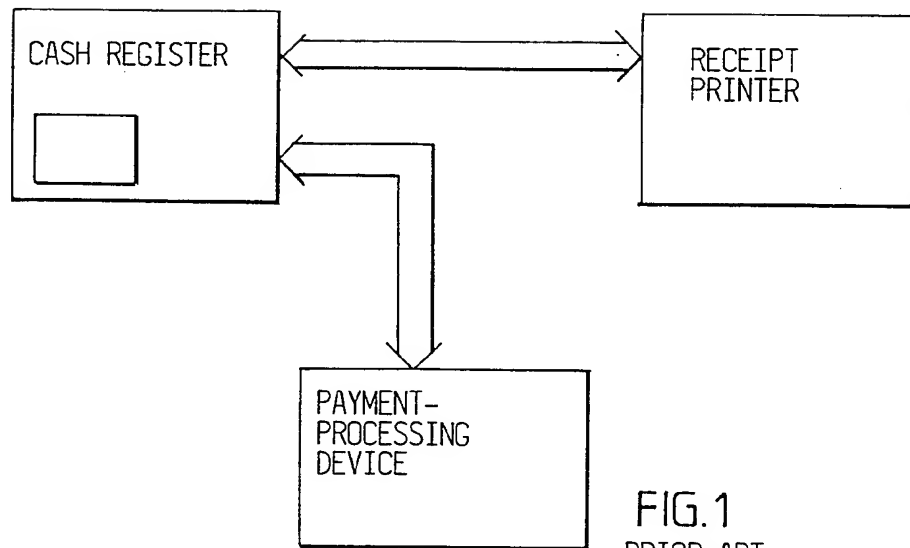
25. A computer program product according to claim 24, further comprising:

means, recorded on the recording medium, for directing the signal-processing device (50) to compare (S6; S6B) the first numerical value (Ba) and
5 the information content (Bi) of said third message such that a comparison result (D) is generated;

means, recorded on the recording medium, for directing the signal-processing device (50), in response to a predetermined comparison result, to deliver (S10) a proceed signal to the payment-processing device (90).

10

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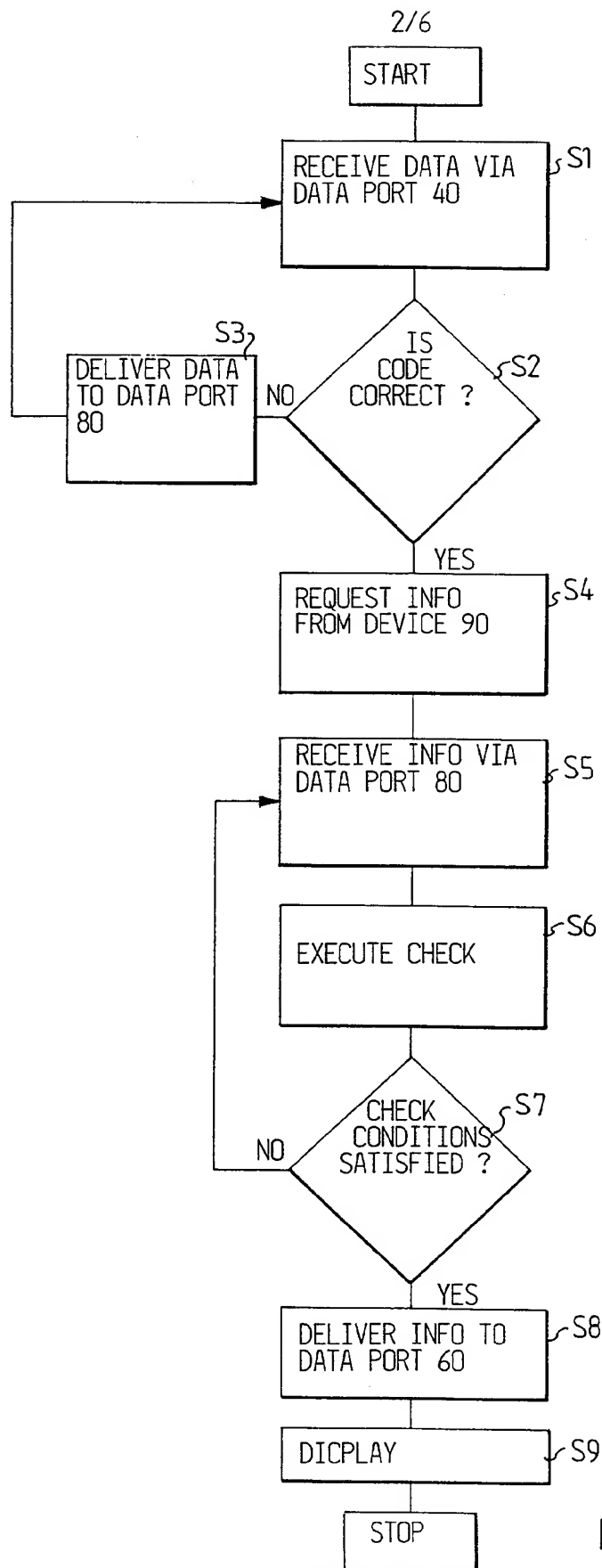


FIG. 3

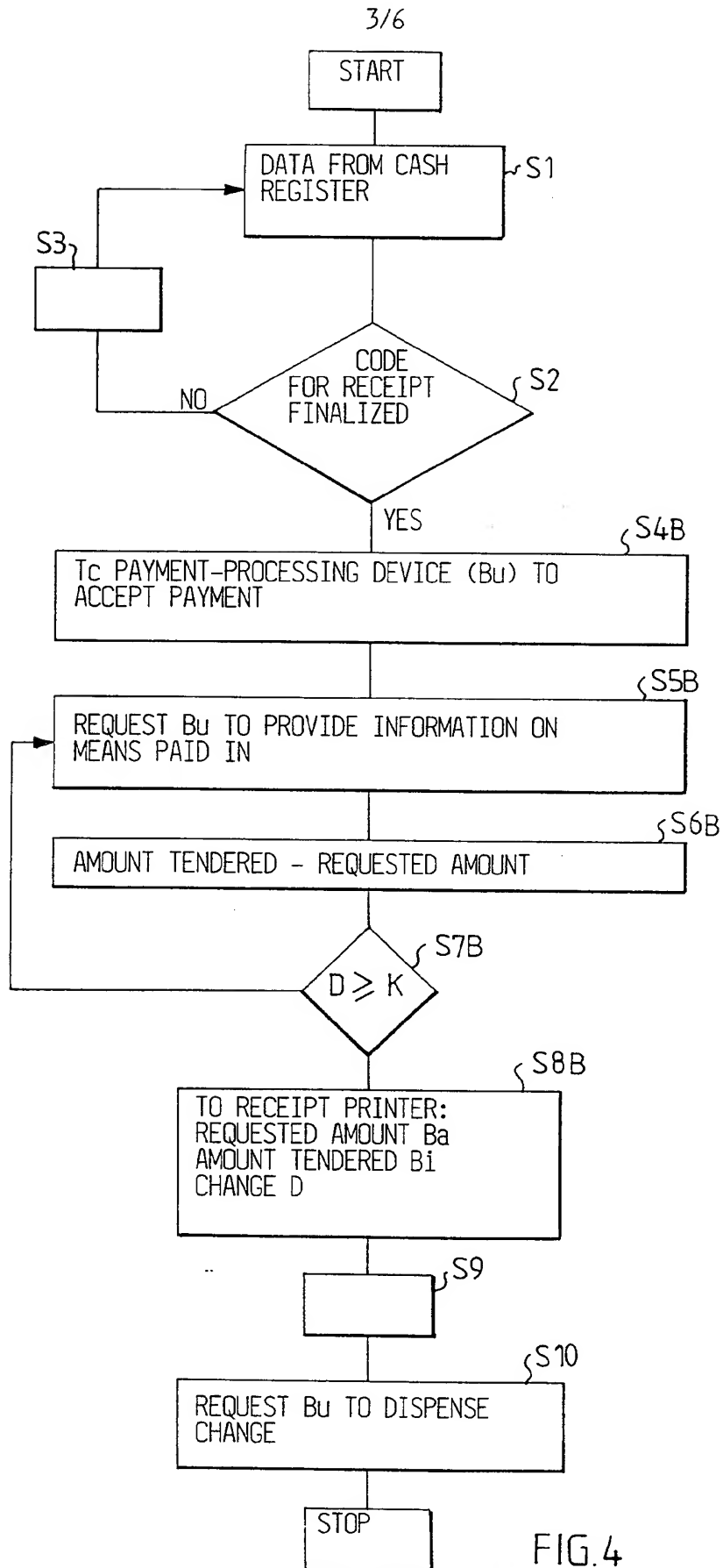
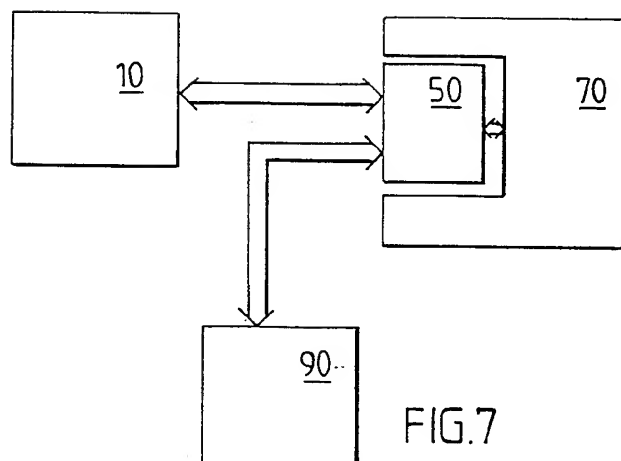
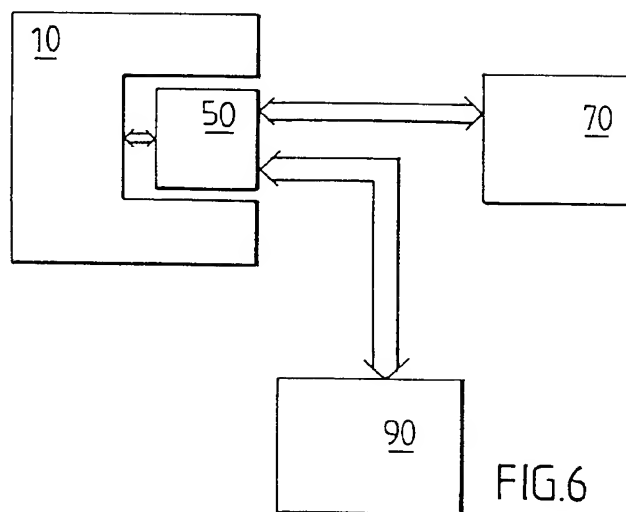
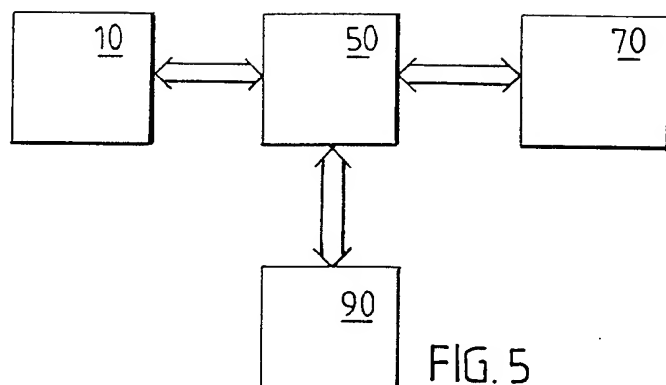


FIG. 4

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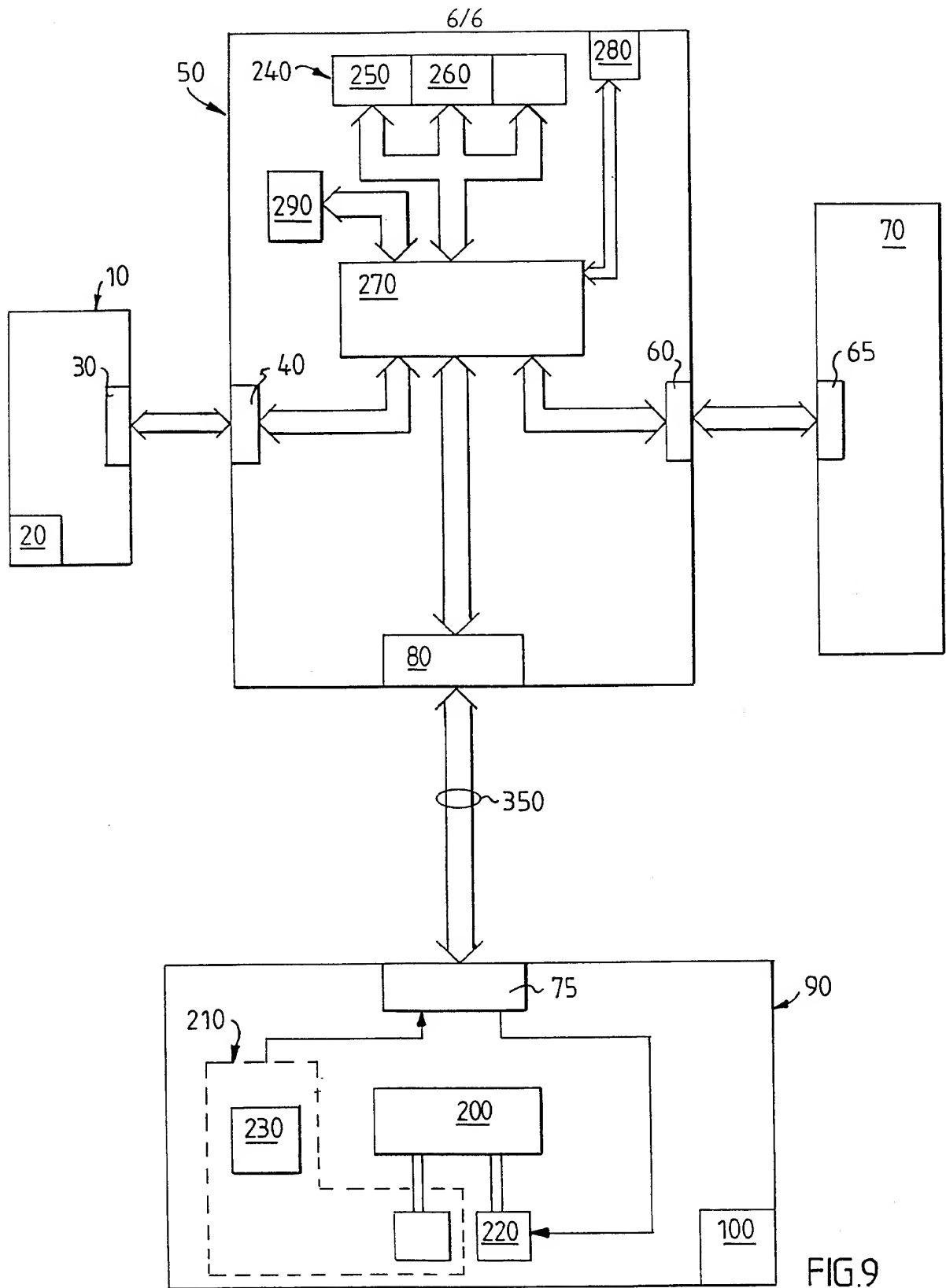


FIG.9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/00710

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G07D 1/06, G07F 19/00, G07G 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G07D, G07F, G07G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9310511 A1 (NYA SYSTEM & IDEER AB), 27 May 1993 (27.05.93) --	1-25
A	US 3330947 A (N. ALPERT ET AL), 11 July 1967 (11.07.67) -----	1-25

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

12 Sept 1996

Date of mailing of the international search report

18 -09- 1996

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INTERNATIONAL SEARCH REPORT
Information on patent family members

31/07/96

International application No.
PCT/SE 96/00710

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A1- 9310511	27/05/93	EP-A,B- 0615643 FI-A- 942348 NO-A- 941909 US-A- 5533627	21/09/94 12/07/94 19/07/94 09/07/96
US-A- 3330947	11/07/67	NONE	